CENTRAL FAX CENTER

JAN 3 1 2007

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.

10/750,522

Confirmation No. 1973

Applicant

Gardner, Donald S. December 31, 2003

Filed

TC/A.U.

2823

Examiner

Lee, Hsien Ming

Docket No. :

042390.P16465

Customer No.:

008791

Commissioner For Patents P.O. Box 1450 Alexandria, VA 22313-1450

AMENDMENT AND RESPONSE

In response to the Office action mailed November 8, 2006, please enter this amendment and consider the following remarks.

Amendments to the claims are reflected in the listing of claims that begins on page 2 of this paper.

Remarks begin on page 8 of this paper.



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Intel Corporation

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Page 1 of 15

Date: January 31, 2007

 To:
 Fax:
 Art Unit:

 Examiner Hsien Ming Lee
 (571) 273-8300
 2823

 From:
 Fax:
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 Philip A. Pedigo
 (503) 264-1729
 JF3-147

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Docket Number:

Filing Date:

Inventor:

10/750,522

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December 31, 2003

Donald A. Gardner

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Derek S. Watson

Date: January 31, 2007



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- Facsimile Cover Sheet (1 page)
- Transmittal Form (1 page)
- Fee Transmittal (1 page submitted in duplicate)
- Response and Amendment to Office Action (11 pages)

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Under the Pa	berwork Reduction Act of 1995	, no persor	Application Number	collection of i	normation	uniess ij	displays a valid OMB control number.	
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FORM			First Named Inventor	Donald A	. Gardner		1441-0 0 000-9	
			Art Unit	2823			JAN 3 1 2007	
(to be used for	all correspondence after initial	filing)	Examiner Name	Hsien Mi	ng Lee		•	
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Firm Name	Intel Corporation		-	•				
Signature	/Philip A. Pedigo/Reg. No	. 52,107/					,	
Printed name	Philip A. Pedigo							
Date	January 31, 2007			Reg. No.	52,10	7		
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Signature /Philip A. Pedigo/Reg. No. 52,107/ Registration No. [Attorney/Agent] 72,107 Telephone 503-712-5560	Signature	/Philip A. Pedigo/R	eg. No. 52,1	07/	Registration	No. 52.107		Telephone	503-712-5560		

Name (Print/Type) Philip A. Pedigo Date January 31, 2007

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HP = highest number of total claims paid for, if greater than 20. Indep. Claims -3 or HP = x = HP = highest number of independent claims paid for, if greater than 3. 3. APPLICATION SIZE FEE If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s). Total Sheets Extra Sheets Number of each additional 50 or fraction thereof - 100 = /50 = (round up to a whole number) x = 4. OTHER FEE(S) Non-English Specification, \$130 fee (no small entity discount) Other (e.g., late filing surcharge):				<u> Fe</u>	e Paid (\$)		_		
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SUBMITTED BY			
Signature	/Philip A. Pedigo/Reg. No. 52,107/	Registration No. (Altorney/Agent) 52,107	Telephone 503-712-5560
Name (Print/Type)	Philip A. Pèdigo		Date January 31, 2007

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an electrical contact formed on an upper surface of the layer of semiconductor material to provide an electric field to alter the electro-absorption of light in the optically active layer.

- 3. (Currently Amended) The device of claim 4 2, wherein the layer of SiGe is a strained layer of SiGe having a dopant to provide electrons in the strained layer of SiGe.
- 4. (Original) The device of claim 3, wherein the dopant is at least one of arsenic, phosphorus, and antimony.
- 5. (Original) The device of claim 3, wherein the strained layer of SiGe is between 20 and 70 percent Germanium.
- 6. (Original) The device of claim 5, wherein the strained layer of SiGe is 27 percent Germanium.
- 7. (Original) The device of claim 3, wherein the substrate is formed from silicon.

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8. (Original) The device of claim 3, further comprising:

a second layer of semiconductor material formed on an upper surface of the substrate; and

wherein the optically active layer is formed on an upper surface of the second layer of semiconductor material.

- 9. (Original) The device of claim 8, wherein the second layer of semiconductor material is formed from silicon.
- 10. (Original) The device of claim 3, wherein the optically active layer further comprises:

a layer of semiconductor material formed on an upper surface of the first strained layer of SiGe; and

a second strained layer of SiGe formed on an upper surface of the semiconductor layer to provide a second quantum well, wherein the second strained layer of SiGe is doped with arsenic.

11. (Original) The device of claim 10, wherein a ratio of silicon to germanium in the first strained layer is different than a ratio of silicon to germanium in the second strained layer.

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- 12. (Currently Amended) The device of claim +2, wherein the optical modulator is an optical waveguide modulator.
- 13. (Original) The device of claim 12, further comprising an optical cavity in optical communication with the optically active layer.
- 14. (Currently Amended) The device of claim ± 2 , wherein the layer of SiGe has a thickness between five and thirty nanometers.
- 15. (Currently Amended) The device of claim 4 2, wherein the substrate is formed from germanium.

Claims 16-30 (Withdrawn)

31. (Cancelled) An integrated circuit comprising:a substrate formed from a semiconductor material;

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an optical modulator with an optically active layer formed on the semiconductor substrate, the optically active layer including a strained layer of SiGe having a quantum well to provide electro-absorption of light; and an optical fiber having a first end in optical communication with the optical modulator.

32. (Currently Amended) The system of claim 31 An integrated circuit comprising:

a substrate formed from a semiconductor material;

an optical modulator with an optically active layer formed on the semiconductor substrate, the optically active layer including a strained layer of SiGe having a quantum well to provide electro-absorption of light, wherein the strained layer of SiGe is doped with at least one of arsenic, phosphorus, and antimony; and

an optical fiber having a first end in optical communication with the optical modulator.

- 33. (Original) The system of claim 32, further comprising a light-emitting source fabricated on the semiconductor substrate to provide an optical signal to the optical modulator.
- 34. (Original) The system of claim 33, further comprising a photodetector in optical communication with a second end of the optical fiber to receive light.

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- 35. (Currently Amended) The system of claim 31 32, wherein the substrate is formed from silicon.
- 36. (Original) The system of claim 35, wherein the strained layer of SiGe is between20 and 70 percent Germanium.

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Remarks

The Applicant respectfully requests reconsideration of the present U.S. Patent application as amended herein. Claims 16-30 have been withdrawn. Claims 1 and 31 have been cancelled without prejudice. Claims 2, 3, 12, 14, 15, 32, and 35 have been amended. Thus, claims 2-15 and 32-36 remain pending in the application.

Claim Objections

Claims 32-36 were objected to because of an informality associated with the preambles of each claim. In response, the Applicant has amended the preamble of each claim to correct the informality. Thus, the Applicant respectfully requests that the objection to claims 32-36 be withdrawn.

Allowable Subject Matter

Claims 2-11 and 32-34 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 2-11 depend (directly or indirectly) from claim 1 and claims 32-36 depend (directly or indirectly) from claim 31.

Claim 2 has been rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 3, 12, 14, and 15 have been amended to depend from amended claim 2. Original claims 4-11 and 13 depend (either directly or indirectly) from claim 2. Thus, claim 2 is allowable and claims 3-11 depend from an allowable claim.

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Claim 32 has been rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 35 has been amended to depend from amended claim 32. Original claims 33, 34, and 36 depend (either directly or indirectly) from claim 32. Thus, claim 32 is allowable and claims 33-36 depend (either directly or indirectly) from an allowable claim.

Claim Rejections § 102

Claims 1, 12, and 13 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,954,473 issued to Dehmubed et al. (*Dehmubed*). Claim 1 has been cancelled without prejudice and, thus, the rejection of claim 1 is moot. For at least the reasons set forth below, the Applicant submits that claims 12 and 13 are not anticipated by *Dehmubed*.

Claims 12 and 13 have been amended to depend (directly or indirectly) from allowable claim 2. For at least the reason that dependent claims include the limitations of the claims from which they depend, the Applicant respectfully submits that claims 12 and 13 and are not anticipated by *Dehmubed*.

Claim Rejections § 103

Claim 14 was rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,949,761 issued to Chu et al. (Chu). For at least the reasons set forth below, the Applicant submits that claim 14 is patentable over Chu.

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Claim 14 has been amended to depend (directly or indirectly) from allowable claim 2. For at least the reason that dependent claims include the limitations of the claims from which they depend, the Applicant respectfully submits that claim 14 is patentable over *Chu*.

Claim 15 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Dehmubed in view of U.S. Patent No. 6,424,450 issued to Goossen (Goossen). For at least the reasons set forth below, the Applicant submits that claim 15 is patentable over Dehmubed in view Goossen.

Claim 15 has been amended to depend (directly or indirectly) from allowable claim 2. For at least the reason that dependent claims include the limitations of the claims from which they depend, the Applicant respectfully submits that claim 15 is patentable over *Dehmubed* in view *Goossen*.

Claims 31, 35, and 36 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Dehmubed* in view of U.S. Patent No. 6,403,975 issued to Brunner et al. (*Brunner*). Claim 31 has been cancelled without prejudice and, thus, the rejection of claim 31 is moot. For at least the reasons set forth below, the Applicant submits that claims 35 and 36 are patentable over *Brunner*.

Claims 35 and 36 have been amended to depend (directly or indirectly) from allowable claim 32. For at least the reason that dependent claims include the limitations of the claims from which they depend, the Applicant respectfully submits that claims 35 and 36 are patentable over *Dehmubed* in view *Brunner*.

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Conclusion

The Examiner is respectfully requested to contact the undersigned by telephone if such contact would further the examination of the present application.

Respectfully submitted,

Date: January 31, 2007

/Philip A. Pedigo/ Philip A. Pedigo Reg. No. 52,107 Attorney for Intel Corporation

Intel Corporation 2200 Mission College Blvd. Santa Clara, CA 95052 (503) 712-5560